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Indian Standard
METHOD FOR
DETERMINATION OF CORRECT INVOICE
WEIGHT OF ALL WOOL MATERIALS
(First Revision)

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INDIAN STANDARDS INSTITUTION
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Indian Standard

**METHOD FOR
DETERMINATION OF CORRECT INVOICE
WEIGHT OF ALL WOOL MATERIALS**

(First Revision)

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Indian Standard
METHOD FOR
DETERMINATION OF CORRECT INVOICE
WEIGHT OF ALL WOOL MATERIALS
(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 31 January 1981, after the draft finalized by the Physical Methods of Test Sectional Committee had been approved by the Textile Division Council.

0.2 This standard was first published in 1968 to cover yarns only. It has been revised to make it applicable to wool tops and fabrics and also to include the use of benzene-methanol mixture for extraction of the material. Also the procedure has been modified to calculate the correct invoice weight on the basis of the oven dry weight of the specimen.

0.3 This standard has been prepared to eliminate unnecessary and undesirable variations in testing procedure for the determination of correct invoice weight (obtained by adding appropriate commercial moisture regain to oven dry weight of the material) of all wool yarns and fabrics.

0.4 To familiarize the industry with International System of Units (SI Units), the basic SI Units as well as the recommended SI Units for use in the textile industry are given in Appendix A.

0.4.1 Standards of Weights and Measures Act 1976 also stipulates use of SI Units.

0.5 In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

*Rules for rounding off numerical values (revised).

1. SCOPE

1.1 This standard prescribes a method for determination of correct invoice weight of all wool tops, yarns and fabrics.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply. For other terms reference to IS : 232-1967* may be made.

2.1 Correct Invoice Weight — The weight of material in a lot calculated from its oven-dry weight by adding to it the appropriate commercial moisture regain.

2.2 Commercial Moisture Regain — An arbitrary value formally adopted as the regain to be used with the oven dry weight when calculating the correct invoice weight of a shipment or delivery of any specific material.

2.3 Package — A general term for a cop, bobbin, tube, pirn, cone, cheese, hank, bundle of tops, yarn or roll of fabrics indicating that the material is in a form convenient for transport or further processing.

3. SAMPLING

3.1 Lot — The quantity of wool material tops, yarn or fabric purporting to be of one definite type and quality delivered to one buyer against one despatch note.

3.2 Sample drawn in compliance with the specification for the material or as agreed between the concerned parties shall be taken to be representative of the lot. Prepare test sample as given in 3.2.1 to 3.2.3.

3.2.1 Tops — If the wool is in the form of tops, a length of about one metre shall be removed from each top after discarding any portion. The material taken from different tops shall be thoroughly mixed and a test sample of about 200 g shall be drawn by suitable method.

3.2.2 Yarn

- a) If the yarn is in the form of cops, bobbins, tubes, pirns or other primary packages, the sample shall be divided into two parts. From the top portion of each package in the first part of the sample and from about half way through each package in the second part of the sample, a length of yarn shall be reeled off so that *firstly* the lengths of yarn reeled off from the various packages are approximately equal in weight and *secondly* their total weight is approximately 200 g.

*Glossary of textile terms — natural fibres (*first revision*).

- b) If the yarn is in the form of cones, cheeses or other large packages, from each package in the sample, two lengths of yarn, one from the outer portion of the package and another from near the middle portion shall be reeled off so that, *firstly* the lengths of yarn reeled off from the various packages are approximately equal in weight and *secondly* their total weight is approximately 200 g.
- c) The length of yarn obtained as in (a) or (b) above, shall constitute the test sample.

3.2.3 Fabrics — From different portion of the fabric sample(s) cut 3 or 4 sample square pieces of approximately equal size, their total weight should be about 200 g. This shall constitute the test sample.

4. APPARATUS

4.1 Drying Oven — preferably of the ventilated type, capable of maintaining and inside temperature of $105 \pm 3^{\circ}\text{C}$.

4.2 Weighing Balance — capable of weighing accurately to 0.000 1 g.

4.3 Soxhlet Apparatus — with auxiliaries like beaker, weighing flasks, etc.

5. REAGENTS

5.0 Quality of Reagents — Unless specified otherwise, pure chemicals shall be employed in tests and distilled water shall be used where the use of water as reagent is intended.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

5.1 Benzene — sp gr 0.879 0 (*see IS : 1840-1961**).

5.2 Methanol — sp gr 0.791 7 (*see IS : 517-1967†*).

6. PROCEDURE

6.1 Determine the weight of the consignment(w). From the test sample of 200 g, take a test specimen weighing about 10 g and put it in a polyethylene bag of known weight, and seal it in the environment in which the consignment is housed. Weigh the bag and find the weight of the test specimen (W_g). Take care to see that no change in the moisture content of the test specimen takes place during the drawing and weighing of the sample.

*Specification for benzene, reagent grade.

†Specification for methanol (methyl alcohol) (*first revision*).

6.2 Take the test specimen and wrap it in a filter paper. Extract the specimen with the 300 ml of benzene-methanol mixture [3 : 2 (v/v)] in a soxhlet apparatus for three hours, siphoning the solvent at a minimum rate of 6 extractions per hour. Remove the test specimen and dry it to constant weight in an oven at a temperature of $105 \pm 3^{\circ}\text{C}$. Determine the weight of the dried extracted specimen (W_o).

6.3 Repeat the test with one more test specimen.

7. CALCULATION

7.1 Calculate the correct invoice weight of the consignment by the following formula:

$$W_c = W \times \frac{W_o}{W_g} \times \frac{100 + R}{100}$$

where

W_c = correct invoice weight of the consignment,

W = original weight of the consignment,

W_o = oven dry weight of the deoiled specimen,

W_g = original weight of the specimen, and

R = commercial moisture regain value (see Note).

NOTE — For the commercial moisture regain values reference to IS : 7033-1973* shall be made.

7.1.1 Calculate the correct invoice weight of the consignment by using the following given in **7.1**.

7.2 Calculate the average of the two values obtained as in **7.1** and **7.1.1**, if the difference between the two is not more than 0.5 percent.

8. REPORT

8.1 The report shall include the following information:

- a) Type of material,
- b) Invoice weight of the consignment,
- c) Commercial moisture regain values used, and
- d) Correct invoice weight of the consignment.

*Commercial moisture regain values for wool and its products.

A P P E N D I X A
(Clause 0.4)
RECOMMENDED SI UNITS FOR TEXTILES

SL No.	CHARACTERISTIC	SI UNIT		APPLICATION
		Unit	Abbreviation	
(1)	1) Length	Millimetre	mm	Fibres
		Millimetre, centimetre	mm, cm	Samples, test specimens (as appropriate)
		Metre	m	Yarns, ropes, cordages, fabrics
2)	Width	Millimetre	mm	Narrow fabrics
		Centimetre	cm	Other fabrics
		Millimetre, centimetre	mm, cm	Samples, test specimens (as appropriate)
		Centimetre, metre	cm, m	Carpets, druggets, <i>DURRIES</i> (as appropriate)
3)	Thickness	Micrometre (micron)	µm	Delicate fabrics
4)	Linear density	Millimetre	mm	Other fabrics, carpets, felts
		Tex	tex	Yarns
		Millitex	mtex	Fibres
		Decitex	dtx	Filaments, filament yarns
5)	Diameter	Kilotex	ktx	Slivers, ropes, cordages
		Micrometre (micron)	µm	Fibres
6)	Circumference	Millimetre	mm	Yarns, ropes, cordages
		Millimetre	mm	Ropes, cordages
7)	Threads in fabric:			Woven fabrics (as appropriate)
a)	Lengthwise	Number per centimetre	ends/cm	
		Number per decimetre	ends/dm	
b)	Widthwise	Number per centimetre	picks/cm	
		Number per decimetre	picks/dm	
8)	Warp threads in loom	Number per centimetre	ends/cm	Reeds
9)	Stitches in knitted fabric:			Knitted fabrics (as appropriate)
a)	Lengthwise	Courses per centimetre	courses/cm	
		Courses per decimetre	courses/dm	
b)	Widthwise	Wales per centimetre	wales/cm	
		Wales per decimetre	wales/dm	

SL No.	CHARACTERISTIC	SI UNIT		APPLICATION
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
10)	Stitch length	Millimetre	mm	Knitted fabrics, made-up fabrics
11)	Mass per unit area	Grams per square metre	g/m ²	Fabrics
12)	Mass per unit length	Grams per metre	g/m	Fabrics
13)	Twist	Turns per centi-metre Turns per metre	turns/cm turns/m	Yarns, ropes (as appropriate)
14)	Test or gauge length	Millimetre, centi-metre	mm, cm	Fibres, yarns and fabric specimens (as appropriate)
15)	Breaking load	Millinewton Newton	mN N	Fibres, delicate yarns (individual or skeins) Strong yarns (individual or skeins), ropes, cordages, fabrics
16)	Breaking length	Kilometre	km	Yarns
17)	Tenacity	Millinewton per tex	mN/tex	Fibres, yarns (individual or skeins)
18)	Twist factor or twist multiplier	Turns per centi-metre × square root of tex Turns per metre × square root of tex	turns/cm × √tex turns/m × √tex	Yarns (as appropriate)
19)	Bursting strength	Newton per square centi-metre	N/cm ²	Fabrics
20)	Tear strength	Millinewton, newton	mN, N	Fabrics (as appropriate)
21)	Pile height	Millimetre	mm	Carpets
22)	Pile density	Mass of pile yarn in grams per square metre per millimetre pile height	g/m ² /mm pile height	Pile carpets
23)	Elastic modulus	Millinewton per tex per unit deformation	mN/tex/ unit deformation	Fibres, yarns, strands

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Grading of fibres and yarns	Spinning machinery components
Grading of raw silk	Terminology
Hosiery	Textile floor coverings
Jute — bags and fabrics	Textile materials for fishing
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